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Gary M. Hartman — August 29, 2006 Date

U.S. Patent Application Serial No. **10/605,858**

TECHNOLOGY CENTER **1700** PERSONNEL:

Attention: EXAMINER KIRSTEN C. JOLLEY
Phone: (571) 272-1421

THE FOLLOWING **39** -PAGE DOCUMENT IS A

RESPONSE AFTER FINAL

including:

- [ ] Response under 37 CFR §1.116
- [ ] Notice of Appeal
- [X] Appeal Brief under 37 CFR §41.37
- [ ] Reply Brief under 37 CFR §41.41
- [ ] Request for Continued Examination (RCE) Transmittal
- [X] Other: Fee Transmittal Form

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	:	10/605,858	Confirmation No. **2857**
Applicant	:	Dong-Sil Park et al.	
Filed:	:	October 31, 2003	
TC/Art Unit:	:	1762	
Examiner	:	Kirsten Jolley	
Docket No.	:	132855	
Customer No.	:	30952	

Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

APPEAL BRIEF UNDER 37 CFR §41.37

This is an appeal from the Examiner's final rejection made in an Office Action dated February 2, 2006 (Paper No. 20060130), of claims pending in the above-identified US patent application. Please charge the requisite fee and any other necessary charges to the General Electric Company, Account No. 07-0865, in accordance with the attached Fee Transmittal form.

08/30/2006 TL0111 00000025 070865 10605858
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Application No. 10/605,858
Technology Center 1762
Docket No. 132855
Appeal Brief dated August 29, 2006

TABLE OF CONTENTS:

REAL PARTY IN INTEREST

The real party in interest is the General Electric Company, the assignee of record.

RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals or interferences known to Appellants or Appellants' assignee or Appellants' representative that would directly affect or be directly affected by or have a bearing on this appeal regarding the above-identified patent application.

STATUS OF CLAIMS

Claims 1-20 were originally presented in this application. Claims 21-30 were introduced by an amendment filed November 26, 2004, and claims 31-33 were introduced by an amendment filed November 16, 2005. Of these claims:

Claims 8 and 27 have been canceled;

Claims 1-7, 9-26, and 28-33 remain pending in the application; and

Claims 1-7, 9-26, and 28-33 are rejected.

Claims 1-7, 9-26, and 28-33 are the subject of this appeal.

STATUS OF AMENDMENTS

Following the final rejection, Appellants filed a response under 37 CFR §1.116, on June 2, 2006, with amendments to independent claims 1 and 21 to incorporate all limitations of their respective dependent claims 2 and 22. In an Advisory Action filed June 20, 2006 (Paper No. 20060614), the Examiner refused to enter Appellants' amendments.

SUMMARY OF CLAIMED SUBJECT MATTER

As stated at Paragraph [0001] of their specification (all paragraph numbers are in reference to the numbering assigned by the USPTO authoring software), Appellants' invention is directed to a process of forming a diffusion coating, and more particularly to a process and material capable of locally producing a diffusion coating on limited surface regions of a substrate.

For the convenience of the Board, each independent claim under appeal is reproduced below, immediately followed by a concise explanation of the subject matter defined in the claim.

> Claim 1: A process of forming a diffusion coating on a component, the process comprising the steps of:
>
> mixing a particulate donor material containing a coating element, an activator dissolved in a solvent, and a particulate filler to form an adhesive mixture having a formable, malleable consistency, wherein the adhesive mixture does not contain an extraneous binder and the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator;
>
> applying the adhesive mixture to at least one surface of the component; and
>
> heating the component to a temperature sufficient to vaporize and react the activator with the coating element of the donor material to form a reactive vapor of the coating element, the reactive vapor reacting at the at least one surface of the component to form a diffusion coating containing the coating element.

As recited in independent claim 1, Appellants' claimed process involves mixing a particulate donor material containing a coating element, an activator dissolved in a solvent, and a particulate filler to form an adhesive mixture having a formable, malleable consistency. Paragraphs [0009] (lines 3-6), [0016] (lines 3-7), and [0017] (lines 8-10). The adhesive mixture does not contain an extraneous binder and the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator. Paragraphs [0010] (lines 1-3 and 8-12) and [0019]. The adhesive mixture is then applied to at least one surface of a component. Paragraphs [0009] (lines 6-7) and [0016] (lines 7-15), and Figure 1. Finally, the component is heated to a temperature sufficient to vaporize and react the activator with the coating element of the donor material to form a reactive vapor of the coating element, which reacts at the component surface to form a diffusion coating containing the coating element. Paragraphs [0009] (lines 7-11) and [0018] (lines 5-9), and Figures 2, 3, and 4.

> Claim 13: A process for forming a diffusion aluminide coating on a superalloy component of a gas turbine engine, the process comprising the steps of:
> dissolving at least one ammonium halide activator in water to form an ammonium halide-containing solution;
> mixing a particulate donor material containing aluminum and a

particulate filler to form a powder mixture;

mixing the powder mixture and the ammonium halide-containing solution to form an adhesive mixture having a formable, malleable consistency, the donor material and the filler within the adhesive mixture being cohered solely by the at least one dissolved activator;

applying the adhesive mixture to at least one surface of the component;

drying the adhesive mixture to evaporate the water from the adhesive mixture and thereby form a solid pack that adheres to the at least one surface of the component, the at least one ammonium halide activator binding the donor material and the filler together within the solid pack; and then

heating the component in an inert or reducing atmosphere to a temperature that is held for a duration sufficient to vaporize and react the at last one ammonium halide activator with the aluminum of the donor material to form an aluminum halide vapor, the aluminum halide vapor reacting at the at least one surface of the component to form a diffusion aluminide coating.

From the above, it can be seen that independent claim 13 contains the limitations found in independent claim 1, with the following additional limitations. The diffusion coating is a diffusion aluminide coating and the component is a superalloy component of a gas turbine engine. Paragraphs [0009] (lines 1-3) and [0015], and Figure 1. The adhesive mixture is formed by first dissolving at least one ammonium halide activator in water to form an ammonium halide-containing solution, mixing a particulate donor material containing aluminum and a particulate filler to form a powder mixture, and then

mixing the powder mixture and the ammonium halide-containing solution to form the adhesive mixture. Paragraph [0027] (lines 1-5). After applying the adhesive mixture to at least one surface of the component, the adhesive mixture is dried to evaporate the water from the adhesive mixture and thereby form a solid pack that adheres to the component surface, with the at least one ammonium halide activator binding the donor material and the filler together within the solid pack. Paragraphs [0018] (lines 1-5). Finally, the heating step occurs in an inert or reducing atmosphere at a temperature and for a duration sufficient to vaporize and react the ammonium halide activator with the aluminum of the donor material to form an aluminum halide vapor, and the aluminum halide vapor reacts at the component surface to form the diffusion aluminide coating. Paragraphs [0018] (lines 4-9).

> Claim 21: A process of forming a diffusion coating on a component, the process comprising the steps of:
> dissolving an activator in a solvent to form an activator solution;
> mixing a particulate filler and a particulate donor material containing a coating element with the activator solution to form an adhesive mixture having a formable, malleable consistency, wherein the adhesive mixture does not contain an extraneous binder, and the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator;
> applying the adhesive mixture to at least one surface of the component; and
> heating the component to a temperature sufficient to vaporize

> and react the activator with the coating element of the donor material to form a reactive vapor of the coating element, the reactive vapor reacting at the at least one surface of the component to form a diffusion coating containing the coating element.

From the above, it can be seen that independent claim 21 contains all limitations found in independent claim 1, with the additional limitation that the adhesive mixture is formed by first dissolving the activator in a solvent to form an activator solution, after which the particulate filler and the particulate donor material are mixed with the activator solution to form the adhesive mixture. Paragraph [0027] (lines 1-5).

Dependent claims 2 and 22 (which depend from independent claims 1 and 21, respectively), further require the limitation recited in independent claim 13 that the adhesive mixture is dried after the applying step to remove the solvent from the adhesive mixture and form a solid pack that adheres to the surface of the component.

In summary, Appellants teach and claim a method for forming a diffusion coating, in which a dissolved activator is used to cohere a donor material and a filler material to form an adhesive mixture that has a formable,

malleable consistency, and does not contain an extraneous binder so that the donor material and the filler are cohered solely by the dissolved activator. Furthermore, if dried this adhesive mixture forms a solid pack that adheres to the surface to which the adhesive mixture was applied.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A concise statement of each ground of rejection presented for review follows:

a) Whether Claims 1-5, 9, 11, 12, 21-25, 28, 30, 31, and 33 are patentable over U.S. Patent No. 3,900,613 to Galmiche et al. (Galmiche) applied under 35 USC §102(b).

a) Whether Claims 6, 7, 10, 13-20, 26, 29, and 32 are patentable over Galmiche applied under 35 USC §103.

ARGUMENT

(A) Rejection under 35 USC §102(b) over Galmiche

Provided immediately below is a discussion of the 35 USC §102 rejection of the claims under appeal, followed by remarks directed to the claims individually or grouped as set forth below. In addressing the §102 rejection, Appellants rely on MPEP §2131, which states:

> A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the ...claim. The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e. identity of terminology is not required. (Citations omitted).

Galmiche discloses a process of forming a diffusion coating of an "application metal" on inner walls of a metallic hollow part "whose inner cavity has oblong or curved zones difficult to reach by a powder or pastry material." Abstract and column 1, lines 24-32. Galmiche's process utilizes a "cement" placed in the inner cavity for the purpose of forming the diffusion coating during a heat diffusion treatment. Abstract. Galmiche's cement is disclosed as

comprising "a powder of the one or more application metals, an inert diluent with a high heat of formation, and a halogen or halogenated compound." As with Applicants' process, Galmiche's "application metal" may be aluminum and Galmiche's "halogen or halogenated compound" may be an ammonium halide activator. Column 1, lines 13-18, and column 3, lines 29-30.

To overcome the difficulty of accessing the inner cavity with "a powder or pasty filler material," Galmiche's cement is also required to contain "a solution of a surface active agent adapted to confer thixotropic properties on the mixture formed by the initial constituents of the cement and by the solution." Abstract. Galmiche defines the "phenomenon of thixotropy" provided by the surface active agent solution as

> a reversable [sic] phenomenon to which certain very viscous products are subject (especially pastes or gels) which are provisionally liquified under the effect of vibration and then resume their initial viscosity after a certain lapse of time in resting condition.
>
> Column 2, lines 10-20.

The role of the surface active agent solution is to confer thixotropic properties to the cement so that during vibration the cement "undergo[es] liquefaction rendering it adapted to occupy the whole of the abovesaid cavity including its

zones which are most withdrawn and most difficult of access." Column 2, lines 37-48. Once introduced into the inner cavity by vibration, the cement is "left undisturbed until it resumes its initial viscosity." Abstract and column 2, lines 49-52. If necessary, the solvent of the surface active agent can be eliminated with heat (column 2, lines 52-56), after which "[t]he hollow part thus lined with cement is subjected to the heat diffusion treatment proper and, once this heat diffusion treatment is terminated, the cement is removed." Abstract.

In view of the above, the crux of Galmiche's process is the use of a thixotropic mixture formed of three dry ingredients (activator, application (donor) metal, and inert diluent) and "a solution of a surface active agent adapted to confer thixotropic properties on the mixture."

In the Office Action filed August 16, 2005 (Paper No. 20050811), the Examiner cited Galmiche as disclosing

> dissolving ammonium chloride activator in a solvent to form an activator solution, mixing a particulate donor material containing a coating element with the activator solution to form an adhesive mixture having a cement-like, formable and malleable consistency, wherein the adhesive mixture does not contain an extraneous binder and the donor material and filler are cohered solely by the dissolved activator; . . ..
>
> Office Action of August 16, 2005, page 2.

In support of this conclusion, the Examiner explained

> Example I comprises a step of dissolving ammonium chloride activator in solvent. While the mixture of Galmiche et al. additionally includes a surface active agent such as oleic acid, it is noted that such a surface active agent would not cohere the filler and donor materials. To the contrary, Galmiche et al. teaches that the surface active agent is responsible for conferring thixotropic properties on the mixture. Therefore, the dissolved activator solution must solely cohere the filler and donor materials.
>
> Id. at page 3.

Claims 1, 3-5, 9, 11, 12, and 31

Appellants have argued that Galmiche does not disclose or suggest a step that uses "an activator dissolved in a solvent" (independent claim 1; emphasis added). In response to this argument, the Examiner stated the following in the Office Action filed February 2, 2006:

> isopropyl alcohol is the solvent [for the surface active agent] in Example 1 . . .. ammonium chloride is slightly soluble in alcohol. Therefore it is the Examiner's position that at least some ammonium chloride is dissolved in the isopropyl alcohol solvent. Since isopropyl alcohol is the only liquid other than oleic acid, the dissolved activator must solely cohere the donor material and filler. Oleic acid . . . would not cohere the donor material and filler.
>
> Office Action of February 2, 2006, page 2.

Even if the above is accepted, Galmiche's "solution of a surface active agent" formed by combining a surface active agent and a solvent such as isopropyl alcohol does not disclose Appellants' claimed step of using "an activator dissolved in a solvent" (independent claim 1; emphasis added). Simply stated, Galmiche uses alcohol to dissolve his surface active agent, Galmiche's ammonium halide activator is only "slightly soluble in alcohol" (as admitted by the Examiner), and nothing in Galmiche suggests that a sufficient amount of alcohol is present to dissolve the activator. Even if sufficient alcohol were used to have some effect on the activator, the activator is still only "slightly soluble in alcohol," and therefore would not result in Appellants' claimed step of using "an activator dissolved in a solvent" as the sole ingredient for cohering a donor material and filler (independent claim 1; emphasis added).

In the Office Action of February 2, 2006, the Examiner further argued that, because "surface active agents reduce surface tension between a liquid and a solid, . . . the surface active agent . . . has a property *opposite* of acting as an adhesive or binder" and therefore cannot serve as a binder in Galmiche's mixture. Page 3 (original emphasis). The Examiner overlooks the fact that Galmiche's surface active agent is dissolved, and therefore any physical effect

that Galmiche's dissolved surface active agent may have on Galmiche's mixture (other than that what is disclosed by Galmiche - to "confer thixotropic properties") is purely speculative. Finally, absent teachings to the contrary, it would also seem highly improbable that Galmiche's dissolved surface active agent would not contribute at least slightly to the cohesiveness of Galmiche's mixture, since all other ingredients in Galmiche's mixture are dry powders.

For the above reasons, Appellants respectfully believe that the Examiner has not met the initial burden of establishing a rejection of independent claim 1 and its dependent claims 3-5, 9, 11, 12, and 31 under 35 USC §102, as required by MPEP §2131.

Claims 21, 23-25, 28, 30, and 33

The above arguments made in regard to independent claim 1 and its dependent claims 3-5, 9, 11, 12, and 31 are also applicable to independent claim 21 and its dependent claims 23-25, 28, 30, and 33. Specific to independent claim 21, Galmiche does not disclose or suggest a step that involves "dissolving an activator in a solvent to form an activator solution" (independent claim 21; emphasis added), which is then mixed with a particulate filler and a particulate donor material to form an adhesive mixture.

Again, though the Examiner has argued that an ammonium chloride activator is slightly soluble in the isopropyl alcohol used as the solvent for the surface active agent in Example 1 (Office Action of February 2, 2006, page 2), Galmiche's "solution of a surface active agent" formed by combining a surface active agent and a solvent such as isopropyl alcohol does not disclose Appellants' claimed step of "dissolving an activator in a solvent to form an activator solution" (independent claim 21). Simply stated, Galmiche does not disclose that a sufficient amount of alcohol is used to dissolve a sufficient amount of activator to form a solution. Even if sufficient alcohol were used, the activator is still only "slightly soluble in alcohol," and therefore cannot result in an "activator solution" that Appellants require as a binder in their claimed process.

Therefore, Appellants respectfully believe that the Examiner has also not met the initial burden of establishing a rejection of independent claim 21 and its dependent claims 23-25, 28, 30, and 33 under 35 USC §102, as required by MPEP §2131.

Claims 2 and 22

Dependent claims 2 and 22 (which depend from independent claims 1 and 21, respectively) require the additional step of "drying the adhesive

mixture after the applying step to remove the solvent from the adhesive mixture and thereby form a solid pack adhering to the at least one surface of the component" (emphasis added; a similar step is recited in independent claim 13.)

In the Office Action of February 2, 2006, the Examiner refers to Galmiche's mixture being "adhered" to the surface intended to be coated. See the last paragraphs in sections 3 and 5 of the Office Action. However, Appellants cannot find any support for the Examiner's conclusion that Galmiche's mixture "adheres" to any surfaces. To the contrary, if Galmiche's surface active agent behaves as proposed above by the Examiner ("the surface active agent . . . has a property *opposite* of acting as an adhesive or binder"), then it seems contradictory to conclude that Galmiche's mixture would adhere to anything.

Finally, whether Galmiche's mixture will adhere to a surface is not the complete issue, since Appellants' require that their mixture is dried "to form a solid pack adhering to the at least one surface of the component." Whether Galmiche's mixture could adhere to a surface after being dried to a solid is purely speculative. That the solvent may be removed from Galmiche's mixture by applying heat is not sufficient, since Galmiche's surface active agent (e.g.,

oleic acid) is a liquid and remains within Galmiche's mixture after removal of the solvent.

Again, because Galmiche does not disclose that the mixture - wet or dry - is adhesive, and the Examiner has merely asserted that the mixture is adhesive without citing any basis for this conclusion, Appellants respectfully believe that the Examiner has not met the initial burden of establishing a rejection of claims 2 and 22 under 35 USC §102, as required by MPEP §2131.

(B) Rejection under 35 USC §103 over Galmiche

In view of Appellants' above remarks regarding the rejection under 35 USC §102, Appellants believe that Galmiche also does not teach or suggest their invention as recited in claims 6, 7, and 10 (which depend from claim 1), independent claim 13 and its dependent claims 14-20 and 32, and claims 26 and 29 (which depend from claim 21).

Claims 7 and 10

Claims 7 and 10 depend from claim 1, and therefore also require the limitations from claim 1, such as "an activator dissolved in a solvent" (emphasis added). Again, Appellants respectfully believe that Galmiche fails to disclose or even suggest that a sufficient amount of alcohol is present to dissolve Galmiche's activator, and even if sufficient alcohol were used to affect the activator, the activator is still only "slightly soluble in alcohol" and therefore would not result in Appellants' claimed step of using "an activator dissolved in a solvent" as the sole ingredient for cohering a donor material and filler.

As also argued above under the §102 rejection of claim 1, absent teachings to the contrary, it would seem highly improbable that Galmiche's dissolved surface active agent would not contribute at least slightly to the

cohesiveness of Galmiche's mixture, since all other ingredients in Galmiche's mixture are dry powders. Therefore, Appellants respectfully believe that Galmiche does not teach or suggest the requirement in claim 1 that "the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator."

For the above reasons, Appellants respectfully believe that claims 6, 7, and 10 are not obviated by Galmiche under 35 USC §103.

Claim 29

Claims 26 and 29 depend from claim 21, and therefore also require the limitation from claim 21 that the adhesive mixture is formed by first dissolving the activator in a solvent to form an "activator solution," after which the particulate filler and the particulate donor material are mixed with the activator solution to form the adhesive mixture. Galmiche neither teaches nor suggests forming an "activator solution" - which Appellants believe is far different than the "slightly" dissolved activator proposed by the Examiner.

For the above reasons, Appellants respectfully believe that claims 7 and 10 are not obviated by Galmiche under 35 USC §103.

Claims 13-20 and 32

Independent claim 13 and its dependent claims 14-20 and 32 require "dissolving at least one ammonium halide activator in water to form an ammonium halide-containing solution" (independent claim 13; emphasis added). As argued above, Galmiche neither teaches nor suggests forming an activator "solution" - which Appellants believe is far different than the "slightly" dissolved activator proposed by the Examiner.

As with claims 2 and 22, independent claim 13 and its dependent claims 14-20 and 32 also require the step of "drying the adhesive mixture after the applying step to remove the solvent from the adhesive mixture and thereby form a solid pack adhering to the at least one surface of the component" (emphasis added). Again, whether Galmiche's mixture could adhere to a surface after being dried to a solid is purely speculative. That the solvent may be removed from Galmiche's mixture by applying heat is not sufficient, since Galmiche's surface active agent (e.g., oleic acid) is a liquid and remains within Galmiche's mixture after removal of the solvent. Therefore, there is no basis of record for concluding that Galmiche's mixture - wet or dry - is adhesive.

Finally, Galmiche does not teach or suggest dissolving an activator with water, or whether water can even be used in Galmiche's process without

some adverse result. Therefore, Galmiche cannot be said or provide any motivation for using water as the solvent for Galmiche mixture.

For the above reasons, Appellants respectfully believe that claims 13-20 and 32 are not obviated by Galmiche under 35 USC §103.

Claims 6 and 26

Because claims 6 and 26 depend from claims 1 and 21, respectively, the arguments made above regarding claims 7 and 10 (which depend from claim 1) and 29 (which depends from claim 21) also apply to claims 6 and 26.

Furthermore, as with independent claim 13, claims 6 and 26 require the use of water is the solvent for Appellants' activator. Galmiche does not teach or suggest dissolving an activator with water, or that water is even compatible with Galmiche's process. Therefore, Galmiche cannot be said or provide any motivation for using water as the solvent for Galmiche mixture.

For the above reasons, Appellants respectfully believe that claims 6 and 26 are not obviated by Galmiche under 35 USC §103.

CLOSING

For all of the reasons set forth above, Appellants respectfully request that this Honorable Board of Appeals reverse the Examiner's rejections of the claims under 35 USC §§102 and 103.

Respectfully submitted,

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Attachments: Claims Appendix; Evidence Appendix; Related Proceedings Appendix; Fee Transmittal form

Claim Appendix

Claim 1: A process of forming a diffusion coating on a component, the process comprising the steps of:

mixing a particulate donor material containing a coating element, an activator dissolved in a solvent, and a particulate filler to form an adhesive mixture having a formable, malleable consistency, wherein the adhesive mixture does not contain an extraneous binder and the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator;

applying the adhesive mixture to at least one surface of the component; and

heating the component to a temperature sufficient to vaporize and react the activator with the coating element of the donor material to form a reactive vapor of the coating element, the reactive vapor reacting at the at least one surface of the component to form a diffusion coating containing the coating element.

Claim 2: A process according to claim 1, further comprising the step of drying the adhesive mixture after the applying step to remove the solvent

from the adhesive mixture and thereby form a solid pack adhering to the at least one surface of the component.

Claim 3: A process according to claim 1, wherein the donor material comprises an aluminum alloy.

Claim 4: A process according to claim 1, wherein the coating element is aluminum and the diffusion coating is a diffusion aluminide coating.

Claim 5: A process according to claim 1, wherein the activator is chosen from the group consisting of NH_4Cl, NH_4Br, NH_4I, NH_4F, and NH_4HF_2.

Claim 6: A process according to claim 1, wherein the solvent is water.

Claim 7: A process according to claim 1, wherein the particulate filler comprises an alumina powder.

Claim 8 (Canceled)

Claim 9: A process according to claim 1, wherein the component is a gas turbine engine component formed of a superalloy.

Claim 10: A process according to claim 1, wherein the at least one surface of the component is a repaired surface region that constitutes a limited surface portion of the component.

Claim 11: A process according to claim 1, wherein the component is a new-make component and the at least one surface of the component constitutes a limited surface portion of the component.

Claim 12: A process according to claim 1, wherein the adhesive mixture does not have a uniform thickness following the applying step.

Claim 13: A process for forming a diffusion aluminide coating on a superalloy component of a gas turbine engine, the process comprising the steps of:

dissolving at least one ammonium halide activator in water to form an ammonium halide-containing solution;

mixing a particulate donor material containing aluminum and a particulate filler to form a powder mixture;

mixing the powder mixture and the ammonium halide-containing solution to form an adhesive mixture having a formable, malleable consistency, the donor material and the filler within the adhesive mixture being cohered solely by the at least one dissolved activator;

applying the adhesive mixture to at least one surface of the component;

drying the adhesive mixture to evaporate the water from the adhesive mixture and thereby form a solid pack that adheres to the at least one surface of the component, the at least one ammonium halide activator binding the donor material and the filler together within the solid pack; and then

heating the component in an inert or reducing atmosphere to a temperature that is held for a duration sufficient to vaporize and react the at last one ammonium halide activator with the aluminum of the donor material to form an aluminum halide vapor, the aluminum halide vapor reacting at the at least one surface of the component to form a diffusion aluminide coating.

Claim 14: A process according to claim 13, wherein the donor

material comprises an aluminum alloy chosen from the group consisting of CrAl, CoAl, FeAl, and TiAl alloys.

Claim 15: A process according to claim 13, wherein the at least one ammonium halide activator is chosen from the group consisting of NH_4Cl, NH_4Br, NH_4I, NH_4F, and NH_4HF_2.

Claim 16: A process according to claim 13, wherein the adhesive mixture is prepared to further contain a metal halide activator.

Claim 17: A process according to claim 13, wherein the adhesive mixture is prepared to further contain clay.

Claim 18: A process according to claim 13, wherein the heating step is performed at a temperature of about 800°C to about 1150°C.

Claim 19: A process according to claim 13, wherein the at least one surface of the component constitutes a limited surface portion of the component.

Claim 20: A process according to claim 13, wherein the adhesive mixture does not have a uniform thickness following the applying step.

Claim 21: A process of forming a diffusion coating on a component, the process comprising the steps of:

dissolving an activator in a solvent to form an activator solution;

mixing a particulate filler and a particulate donor material containing a coating element with the activator solution to form an adhesive mixture having a formable, malleable consistency, wherein the adhesive mixture does not contain an extraneous binder, and the donor material and the filler within the adhesive mixture are cohered solely by the dissolved activator;

applying the adhesive mixture to at least one surface of the component; and

heating the component to a temperature sufficient to vaporize and react the activator with the coating element of the donor material to form a reactive vapor of the coating element, the reactive vapor reacting at the at least one surface of the component to form a diffusion coating containing the coating element.

Claim 22: A process according to claim 21, further comprising the step of drying the adhesive mixture after the applying step to remove the solvent from the adhesive mixture and thereby form a solid pack adhering to the at least one surface of the component.

Claim 23: A process according to claim 21, wherein the donor material comprises an aluminum alloy.

Claim 24: A process according to claim 21, wherein the coating element is aluminum and the diffusion coating is a diffusion aluminide coating.

Claim 25: A process according to claim 21, wherein the activator is chosen from the group consisting of NH_4Cl, NH_4Br, NH_4I, NH_4F, and NH_4HF_2.

Claim 26: A process according to claim 21, wherein the solvent is water.

Claim 27 (Canceled):

Claim 28: A process according to claim 21, wherein the component is a gas turbine engine component formed of a superalloy.

Claim 29: A process according to claim 21, wherein the at least one surface of the component is a repaired surface region that constitutes a limited surface portion of the component.

Claim 30: A process according to claim 21, wherein the component is a new-make component and the at least one surface of the component constitutes a limited surface portion of the component.

Claim 31: A process according to claim 1, wherein the adhesive mixture is selectively applied and adhered to the at least one surface of the component, and the heating step causes the diffusion coating to form on essentially only the at least one surface to which the adhesive mixture was selectively applied.

Claim 32: A process according to claim 13, wherein the adhesive mixture is selectively applied and adhered to the at least one surface of the

component, and the heating step causes the diffusion aluminide coating to form on essentially only the at least one surface to which the adhesive mixture was selectively applied.

Claim 33: A process according to claim 21, wherein the adhesive mixture is selectively applied and adhered to the at least one surface of the component, and the heating step causes the diffusion coating to form on essentially only the at least one surface to which the adhesive mixture was selectively applied.

Application No. 10/605,858
Technology Center 1762
Docket No. 132855
Appeal Brief dated August 29, 2006

Evidence Appendix

None.

Application No. 10/605,858
Technology Center 1762
Docket No. 132855
Appeal Brief dated August 29, 2006

Related Proceedings Appendix

None.

PTO/SB/17 (10-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL for FY 2005

Effective 10/01/2004. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete If Known	
Application Number	10/605,858
Filing Date	10/31/2003
First Named Inventor	Dong-Sil Park
Examiner Name	Kirsten C. Jolley
Art Unit	1762
Attorney Docket No.	132855

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number: 07-0865

Deposit Account Name: GENERAL ELECTRIC COMPANY

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	790	2001	395	Utility filing fee	
1002	350	2002	175	Design filing fee	
1003	550	2003	275	Plant filing fee	
1004	790	2004	395	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($) 0.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below	Fee Paid
Total Claims	- 20** =		X	=
Independent Claims	- 3** =		X	=
Multiple Dependent				=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	88	2201	44	Independent claims in excess of 3
1203	300	2203	150	Multiple dependent claim, if not paid
1204	88	2204	44	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	215	Extension for reply within second month	
1253	980	2253	490	Extension for reply within third month	
1254	1,530	2254	765	Extension for reply within fourth month	
1255	2,080	2255	1,040	Extension for reply within fifth month	
1401	340	2401	170	Notice of Appeal	500.00
1402	340	2402	170	Filing a brief in support of an appeal	
1403	300	2403	150	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	245	Design issue fee	
1503	660	2503	330	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 500.00

SUBMITTED BY

(Complete if applicable)

Name (Print/Type)	William Scott Andes	Registration No. (Attorney/Agent) 33,582	Telephone 513-243-5855
Signature		Date	August 29, 2006

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.